

Whipple Barracks (Prescott), Ariz. 5th, Greeneville, Tenn. 7th, Thornville, Mich. 9th, Lansing, Mich. 11th, Villa City, Fla. 12th, Nashville, Tenn. 13th, Villa City, Fla.; Rugby, Tenn. 14th, East Portland, Oregon. 15th, Rugby, Tenn.; Vashon, Wash. 18th, New Providence, Ind. 19th, Belle Plaine, Iowa. 21st, Rugby, Tenn. 22d, North Sutton, N. H.; Riddleton and Rugby, Tenn.; Weatherfield Centre, Vt. 23d, Berkeley and Hydesville, Cal. 24th, Greensborough, Ala.; Berkeley and Hydesville, Cal.; Lexington, Ky.; Princeton, Mo.; Riddleton, Tenn. 25th, Chattanooga, Tenn. 27th, New Providence, Ind. 28th, Kalamazoo, Mich.; Egg Harbor City and Beverly, N. J. 29th, Mansfield, Mass.; Las Vegas, N. Mex. Chattanooga, Tenn., 25th: a meteor was observed at 9.35

p. m., about 30° east of the zenith, and moving in a south-westerly direction. A bright pinkish light followed in its path, and after it had disappeared about 60° from the zenith, a pale pink color was visible for about three seconds.—*Report of L. M. Pindell, observer, Signal Corps.*

MIRAGE.

Mirage were observed as follows: Kimball and Webster, Dak., 28th; Hampton, Iowa, 10th, 11th, and 12th; Santa Fé, N. Mex., 17th and 19th.

SAND STORMS.

The only sand storms reported during the month occurred at Phoenix and Fort McDowell, Ariz., on the 6th.

VERIFICATIONS.

FORECASTS FOR 24 HOURS IN ADVANCE.

[Verifications made by Assistant Professor C. F. Marvin, assisted by Mr. H. E. Williams, chief clerk of the Forecast Division.]

The forecasts for districts east of the Rocky Mountains for September, 1889, were made by Captain James Allen, 3d Cavalry, Signal Officer, and those for the Pacific coast districts were made at San Francisco, Cal., by 2d Lieutenant J. E. Maxfield, Signal Corps.

Percentages of forecasts verified, September, 1889.

| States. | | States. | |
|---------------------------|------|---|------|
| Maine..... | 80.5 | Kentucky..... | 84.6 |
| New Hampshire..... | 83.9 | Ohio..... | 80.4 |
| Vermont..... | 84.5 | West Virginia..... | 86.3 |
| Massachusetts..... | 87.1 | Indiana..... | 83.2 |
| Rhode Island..... | 85.8 | Illinois..... | 84.3 |
| Connecticut..... | 83.7 | Lower Michigan..... | 81.7 |
| Eastern New York..... | 82.1 | Upper Michigan..... | 70.6 |
| Western New York..... | 82.7 | Wisconsin..... | 78.7 |
| Eastern Pennsylvania..... | 82.7 | Minnesota..... | 82.4 |
| Western Pennsylvania..... | 80.4 | Iowa..... | 79.5 |
| New Jersey..... | 77.5 | Kansas..... | 85.0 |
| Delaware..... | 74.8 | Nebraska..... | 83.1 |
| Maryland..... | 76.0 | Missouri..... | 78.7 |
| District of Columbia..... | 76.3 | Colorado..... | 83.3 |
| Virginia..... | 80.5 | Dakota..... | 82.3 |
| North Carolina..... | 82.1 | Southern California*..... | 86.1 |
| South Carolina..... | 84.9 | Northern California*..... | 88.9 |
| Georgia..... | 85.3 | Oregon*..... | 88.9 |
| Eastern Florida..... | 83.9 | Washington Territory*..... | 84.5 |
| Western Florida..... | 89.0 | By elements: Weather..... | 85.5 |
| Alabama..... | 89.2 | Temperature..... | 78.1 |
| Mississippi..... | 87.0 | Monthly percentage of weather and temperature combined..... | 82.5 |
| Louisiana..... | 89.3 | | |
| Arkansas..... | 77.3 | | |
| Tennessee..... | 82.5 | | |

* In determining the monthly percentage of weather and temperature combined, the Pacific coast states are not included. † The monthly percentage of weather and temperature combined is determined by multiplying the percentage of weather by 6, and the percentage of temperature by 4, and dividing their sum by 10. ‡ The forecasts of temperature in districts east of the Rocky Mountains for September, 1889, were made with reference to the maximum temperature alone; that is, a prediction of warmer or cooler indicated that the maximum temperature of the day designated would be higher or lower than the maximum of the previous day.

FORECASTS FOR 48 AND 72 HOURS IN ADVANCE.

Appreciating the great importance that long time predictions possess for the general public, the Chief Signal Officer has authorized forecasts for forty-eight and seventy-two hours, covering the second and third day in advance. Such forecasts are optional with the predicting officer, and are only made when clearly in the public interest, and cover, in all cases, considerable areas of country, and are not confined to localities.

Percentages of verifications of forecasts made for second day in advance. Number of predictions made: weather, 38;

temperature, 44. Percentages of verifications: weather, 73.2; temperature, 83.9. Weather and temperature combined, 78.4.

Percentages of verifications of forecasts made for third day in advance. Number of predictions made: weather, 13; temperature, 7. Percentages of verifications: weather, 97.7; temperature, 35.9. Weather and temperature combined, 81.3.

FORECASTS FOR 48 AND 72 HOURS IN ADVANCE, FOR AUGUST, 1889.

[Made by Capt. H. H. C. Dunwoody.]

Percentages of verifications of forecasts made for second day in advance. Number of predictions made: weather, 24; temperature, 36. Percentages of verifications: weather, 71.7; temperature, 94.4. Weather and temperature combined, 80.8.

Percentage of verifications of forecasts made for third day in advance. Number of predictions made: weather, none; temperature, 8. Percentage of verifications: temperature, 100.

CAUTIONARY SIGNALS FOR SEPTEMBER, 1889.

Statement showing percentages of justifications of wind signals for the month of September, 1889:

Wind signals.—(Ordered by Captain James Allen.) Total number of signals ordered, one hundred and fifty-five; justified as to velocity, wholly, ninety-five, partly, ten; justified as to direction, one hundred and fifty-one. Of the signals ordered, one hundred and fourteen were cautionary, of which seventy-three were wholly, and two partly, justified; and forty-one were storm signals, of which twenty-two were wholly, and eight partly, justified. Seventy-one signals were ordered for easterly winds, of which sixty-seven were justified, and eighty-four were ordered for westerly winds, all of which were justified. Percentage of justifications, 71.6.

Cold-wave signals.—(Ordered by Assistant Prof. T. Russell.) Two cold-wave signals were ordered during the month, neither of which were justified.

Percentages of local verifications of weather and temperature signals reported by directors of the various State Weather Services for September, 1889.

| States. | Weather. | Temperature. | States. | Weather. | Temperature. |
|--------------------------|----------|--------------|---------------------|----------|--------------|
| Illinois..... | 74.6 | 80.1 | Missouri..... | 82.0 | 85.0 |
| Indiana..... | 80.0 | 83.0 | Nebraska..... | 88.0 | 85.9 |
| Kansas..... | 92.7 | 89.8 | New Jersey..... | 89.0 | 92.5 |
| Louisiana, northern..... | 68.0 | 96.0 | New York..... | 79.0 | 82.0 |
| Louisiana, southern..... | 64.0 | 92.0 | Ohio..... | 79.0 | 85.0 |
| Michigan..... | 86.1 | 82.8 | Pennsylvania..... | 88.0 | 89.0 |
| Minnesota..... | 76.0 | 73.0 | South Carolina..... | 86.4 | 84.6 |

STATE WEATHER SERVICES.

[Temperature in degrees Fahrenheit; precipitation, including melted snow, in inches and hundredths.]

The following extracts are republished from reports for September, 1889, of the directors of the various state weather services:

ALABAMA.

The temperature was below the normal. Light frost occurred on the 19th, 20th, and 28th, but caused no damage to vegetation.

The rainfall during the month was not uniformly distributed over the state. In north Alabama the precipitation was large and showers were constant during the month; in middle Alabama there was a deficiency of rain, and in